

## REMARKS

### Status of claims

Applicants thank the Examiner for the consideration given to the present application. Claim 8 is amended to correct an informality. Support for the amendment is found in the specification and drawings. No new matter has been added. Claims 1-3, 5-9, and 11-18 are pending in the present application.

### Objection to the Claims under 37 CFR 1.75(c)

Claim 8 is objected under 37 CFR 1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim. Accordingly, claim 8 has been amended to correct the objection. Thus, Applicants respectfully request the objection to this claim be withdrawn.

### Rejection of the Claims under 35 U.S.C. §103

Claims 1-3, 5-6 and 16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Mitsumori et al, U.S. Patent No. 4,045,553 in view of the admitted prior art by applicant and Jagtoyen et al, Pub. No. US 2004/0040906. Claims 7-9, 11-12 and 17 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsumori et al, in view of admitted prior art by applicant. Claims 13 and 18 have been rejected under 35 U.S.C. 103(a) as being anticipated by Koslow, U.S. Patent No. 6,630,016 in view of alleged admitted prior art by applicant. Claim 14 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsumori et al in view of admitted prior art by applicant as applied to claim 7 above, and further in view of Jagtoyen et al. Claim 15 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Koslow in view of admitted prior art by applicant as applied to claim 13 above, and further in view of Jagtoyen et al. Applicants respectfully traverse the rejections and submit that the burden for a prima facie case of obviousness under §103 has not been met.

In order to establish a prima facie case of obviousness under §103, the Examiner has the burden of showing, by reasoning or evidence, that: 1) there is some suggestion or motivation, either in the references themselves or in the knowledge available in the art, to modify that reference's teachings; 2) there is a reasonable expectation on the part of one of ordinary skill in

the art that the modification or combination has a reasonable expectation of success; and 3) the prior art references (or references when combined) teach or suggest all the claim limitations. (Emphasis added, *MPEP* §2145).

Applicants' independent claims 1, 7, and 13 recite a filter comprising, *inter alia*, a filter material that is formed at least in part from mesoporous activated carbon filter particles, wherein a portion of the mesoporous activated carbon filter particles are partially coated with silver, and wherein the filter has a Filter Bacterial Log Removal (F-BLR) of greater than 2 logs and a Filter Viruses Log Removal (F-VLR) of greater than about 1 log. The Examiner acknowledges that Mitsumori et al. do not disclose a plurality of mesoporous activated carbon filter particles and the filter having a F-BLR of greater than about 2 logs and a F-VLR of greater than about 1 log. However, the Examiner asserts that Applicants describes known mesoporous and basic activated carbon powder known as Nuchar RGC in a Teflon® housing wherein the RGC has properties of F-BLR of about 3.0 log and F-VLR of about 4.4 log. Applicants respectfully submit that this assertion is incorrect and that the Examiner has misunderstood the teachings of Applicants Examples of the present invention (e.g., Example 3, page 29, lines 13-29; page 33, line 30 - page 34, line 5; and page 34, line 29 - page 35, line 5).

Applicants respectfully submit that the Nuchar RGC powder, singularly or in combination with Mitsumori et al. or any other reference, does not teach or suggest Applicants' filter made from mesoporous activated carbon filter particles, wherein a portion of the mesoporous activated carbon filter particles are coated with silver, and wherein the filter has a F-BLR of greater than 2 logs and a F-VLR of greater than 1 log as recited in Applicants' claims. The Federal Circuit as held that most, if not all, inventions arise from a combination of old elements and thus every element of a claimed invention may often be found in the prior art. *In re Kotzab*, 217 F.3d 1365 (Fed. Cir. 2000). Example 3 of the present Application does disclose a known activated carbon **powder** known as Nuchar RGC as asserted by the Examiner. However, the Nuchar RGC is in powder form and has not been transformed into the filter of the present invention, let alone a filter with the claimed filter characteristics of F-BLR and F-VLR.

For example, as shown in Example 3, the Nuchar RGC powder is mixed with about 7 g of low-density polyethylene (LDPE) FN510-00 binder and about 2 g of aluminosilicate powder. (p. 11, para. [0128]). Applicants further disclose within Example 3 that the mixed powders are

then poured into a circular aluminum mold. The mold is closed and placed in a heated press with platens kept at about 204° C for 1 h. After heating, the mold is allowed to cool to room temperature, opened, and the axial flow filter is removed. As can be seen, the Nuchar RGC is a powder, until it is subjected to the process of the present invention as set forth above in Example 3, which then **transforms** the Nuchar RGC powder into a new and different material filter having the claimed F-BLR and F-VLR values as defined within Applicants' specification.

Moreover, as a powder, the Nuchar RGC does not have, teach, or suggest, explicitly or inherently, a Filter Bacteria Log Removal (F-BLR) or a Filter Virus Log Removal (F-VLR) as defined within Applicants specification because it is not formed into a filter. In fact, none of the other references, singularly or in combination with the Nuchar RGC or each other, teach or suggest a mesoporous activated carbon filter, as defined by the Applicants, being capable of removing bacteria or viruses, let alone having a F-BLR of greater than 2 logs and a F-VLR of greater than 1 log. Applicants point to the definitions of the Filter Bacteria Log Removal (F-BLR) and the Filter Viruses Log Removal (F-VLR), which discloses "the phrase 'Filter Bacteria Log Removal (F-BLR)' refers to the bacteria removal capability of the **filter** after the flow of the first **2,000 filter material pore volumes**" and "the phrase 'Filter Viruses Log Removal (F-VLR)' refers to the virus removal capability of the **filter** after the flow of the first **2,000 filter material pore volumes**." (Emphasis added, p. 3, para. [037] and [039]). The values from Applicants' specification that the Examiner asserts as disclosing the claimed F-BLR and F-VLR values are actually BLRI (BLRI = 3.0 log) and VLRI (VLRI = 4.4 log) values for the Nuchar RGC powder, not F-BLR and F-VLR values of the filter made from the Nuchar RGC powder. (p. 12, para. [0141] and p. 13, para. [0145]).

These BLRI and VLRI values were calculated from a batch process, i.e., "**bath concentration of E. coli bacteria**" in a beaker, not a dynamic measure of the capability of a filter to remove bacteria and viruses after the flow of the first **2,000 filter material pore volumes** have passed through the filter. (See definitions of BLRI and VLRI at p. 2, para. [0031] - p. 3, para. [0036]; see also BLRI and VLRI test procedures at p. 12, para. [0137] - p. 13, para. [0145]). As clearly defined, the F-BLR and F-VLR are both filter characteristics, not powder characteristics, defining the bacterial and viral removal capabilities of the filter recited in the claims. Thus, the Nuchar RGC powder does not obtain the F-BLR and F-VLR characteristics

until it is transformed by the present invention. Therefore, Applicants respectfully submit that the Nuchar RGC powder does not teach or suggest the filter made from mesoporous activated carbon filter particles and partially-coated mesoporous activated carbon filter particles, wherein the filter has the claimed F-BLR and F-VLR values.

Additionally, as acknowledged by the Examiner, Mitsumori et al. does not disclose mesoporous activated carbons or a filter having F-BLR and F-VLR values. As previously set forth by Applicants, Jagtoyen et al. and Koslow do not teach or suggest mesoporous activated carbon filter particles as defined and claimed by Applicants, but microporous activated carbon filters. (June 19, 2006 Response, pp. 8 and 10). Therefore, Applicants respectfully submit that none of the references, singularly or in combination, teach or suggest the mesoporous activated carbon filter having a portion of the mesoporous activated carbon particles partially-coated with silver and a F-BLR of greater than 2 logs and F-VLR of greater than 1 log.

Notwithstanding, neither the references, the knowledge in the art, nor the RGC powder, itself, singularly or in combination teach or suggest the **desirability** of using mesoporous activated carbons to make a filter capable of removing bacteria and viruses, let alone at the F-BLR and F-VLR values recited in the claims. As set forth above, the Federal Circuit has acknowledged that most, if not all, inventions arise from a combination of old elements and thus every element of a claimed invention may often be found in the prior art. *In re Kotzab*, 217 F.3d 1365 (Fed. Cir. 2000). Therefore, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion, or teaching of the **desirability of making the specific combination** that was made by the Applicant. *Id.* at 1369 (citations omitted). The test is Obvious to do, not obvious to try. *In re Tomlinson*, 150 USPQ 623 (CCPA 1966).

Applicants submit that none of the references, singularly or in combination teach, suggest, or motivate one of ordinary skill in the art to use mesoporous activated carbon powder of Nuchar RGC in a filter designed to remove bacteria and viruses, particularly a filter having the claimed F-BLR and F-VLR values. As set forth above, Mitsumori et al. is completely void of any teaching or suggestion as to mesoporous activated carbon particles and a filter having F-BLR and F-VLR values. The only evidence proffered by the Examiner as a motivation to combine the mesoporous activated carbon powder of the Nuchar RGC with the filter of Mitsumori et al. is the

Applicants' own teaching, wherein they took a test batch of Nuchar RGC and tested whether it would remove bacteria and viruses. (See Examples 1 and 2, p. 12, [0141] - p. 13, [0145]). The Nuchar RGC powder, in and of itself, does not teach or suggest transforming the mesoporous activated carbon powder into a filter capable of removing bacteria and viruses, let alone at the claimed F-BLR and F-VLR values. None of the other references, singularly or in combination with any other reference, teach, suggest, or motivate modify Mitsumori et al. with the mesoporous activated carbon powder of Nuchar RGC. In fact, the knowledge in the art taught using microporous activated carbon particles, not mesoporous, to form filters for the removal of bacteria and viruses due to the pore volume size of microporous activated carbon as illustrated by the teachings of Koslow and Jagtoyen et al.

Moreover, "Obviousness does not require absolute predictability but a reasonable expectation of success is necessary." In re Clinton, 527 F.2d 1226, 188 USPQ 365 (CCPA 1976). Applicants submit that void of any teaching, suggestion, or motivation as to the use of or benefit of mesoporous activated carbon particles in a filter for removing bacteria and viruses, one of ordinary skill in the art would have no reasonable expectation of success and thus no motivation to combine Nuchar RGC with Mitsumori et al., Jagtoyen et al., and/or Koslow.

In addition, none of the references, singularly or in combination, teach, suggest, or motivate coating the mesoporous activated carbon powder of Nuchar RGC with silver. Applicants submit that just because Mitsumori et al. teaches a silver coating on activated carbon is effective to remove bacteria, it does not necessarily provide one of ordinary skill in the art a reasonable expectation that silver would effectively coat mesoporous activated carbon and would provide a filter having F-BLR and F-VLR values as claimed. For example, the mesoporous activated carbon of Nuchar RGC may have different pore volume, surface chemistry, and other characteristics than that of the activated carbon disclosed in Mitsumori et al., which may affect the silver of Mitsumori et al. from bonding to and/or dispersing along the mesoporous activated carbon powder of Nuchar RGC. Thus, Applicants respectfully submit that none of the references, singularly or in combination, provide one of ordinary skill in the art a reasonable expectation of success that the silver of Mitsumori et al. would successfully and effectively coat the mesoporous activated carbon powder of Nuchar RGC as recited in Applicants' claims.

Also, contrary to the Examiner's assertion, the Nuchar RGC powder is not in a Teflon<sup>®</sup> housing and thus does not disclose a mesoporous activated carbon in a housing. Applicants, after transforming the Nuchar RGC powder into the filter of the present invention, disclose "the filter is placed in the Teflon<sup>®</sup> housing described in the test procedures below." (p. 11, para. [0128]). Thus, Example 3 of Applicants' specification does not disclose the mesoporous activated carbon particles of Nuchar RGC in a Teflon<sup>®</sup>.

Applicants submit that it appears that the Examiner has mistakenly used Applicants' own teachings against them. The Federal Circuit has repeatedly warned against using the Applicants' disclosure as a blueprint to reconstruct the claimed invention out of isolated teachings in the prior art. See, e.g., *Grain Processing Corp. v. American Maize-Products*, 840 F.2d 902, 907, 5 USPQ2d 1788, 1792 (Fed. Cir. 1988). As set forth above, the references do not teach, suggest, or motivate modifying the bacteria-removing filter of Mitsumori et al. with the mesoporous activated carbon of the Nuchar RGC powder and do not provide any reasonable expectation that such modification would be successful, that silver may be effectively coated onto mesoporous activated carbon particles, and that the filter would have the claimed F-BLR and F-VLR values. Moreover, the Example 3 of Applicants' specification does not disclose that the Nuchar RGC is in a Teflon<sup>®</sup> housing, but teaches placing the filter of the present invention into a Teflon<sup>®</sup> housing. Thus, Applicants are left to conclude that the Examiner has mistakenly used Applicants' own specification as a blueprint to reconstruct the claimed invention.

Therefore, Applicants respectfully submit that none of the references teach or suggest, singularly or in combination, a filter formed in part from mesoporous activated carbon filter particles, wherein a portion of those particles are partially coated with silver, and wherein the filter has a F-BLR of greater than 2 logs and a F-VLR of greater than 1 log as recited in claims 1, 7, and 13. Accordingly, Applicants respectfully request the rejections of independent claims 1, 7, and 13 under §103 be withdrawn. As claims 2, 3, 5, 6, 8, 9, 11, 12, and 14-18 depend from independent claims 1, 7, or 13, the Applicants request the rejections of these claims under §103 be withdrawn as well.

#### CONCLUSION

Applicants respectfully submit that the present application is in condition for allowance. The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully solicited.

Respectfully submitted,  
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